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A Volume Table for Virginia Pine In Prince Georges County, Maryland

NOTICE

This issue introduces a change in format of our Research Notes. Earlier notes in this series were issued as half-page folders.

During the last 50 years Virginia pine (Pinus virginiana Miller) has emerged as a tree of commercial importance. Once regarded as a weed species, Virginia pine is short-lived and limby, but it makes rapid early growth. It is used chiefly for pulpwood. Some sawlogs are cut from older stands, but they yield only common-grade lumber. Occasionally an older, well-formed stand will produce some piling.

As use of this species increased, the need for volume tables arose. Some volume tables have been prepared for localities where demand for Virginia pine has been greatest; they showed volume in board feet and cords.

But there are great variations in board-foot volume, depending on the log rule used. And cordwood volume is affected by size of stick, crook, knottiness, and method of stacking. So the cubic foot seems to be the best measure of actual wood content. It can readily be converted into cords or board feet.

Several cubic-foot volume tables have been constructed for Virginia pine, by diameter and height classes. Most of these give total tree volume. However, McIntyre constructed a merchantable cubic-foot volume table for this species in Pennsylvania.¹

Since it was possible that volume data for Pennsylvania would not apply to trees growing in Prince Georges County, Maryland, a local volume table was designed (table 1). A comparison of the two tables showed that, for diameter classes above 10 inches, the merchantable cubic-foot volume in Maryland became progressively greater than that in Penn-

¹McIntyre, A. C. Virginia pine in Pennsylvania. Pa. State Coll. Bul. 300. 31 pp. 1933.

Table 1.--Merchantable cubic-foot volume table
for Virginia pine in Prince Georges County, Md.

D.b.h. (inches)	Merchantable volume*	
	Sawlogs	Total
	<u>Cubic</u> <u>feet</u>	<u>Cubic</u> <u>feet</u>
5	—	1.95
6	—	3.50
7	—	5.65
8	—	8.37
9	9.73	10.93
10	13.41	14.63
11	17.60	18.84
12	22.26	23.53
13	27.33	28.63
14	32.64	34.01
15	38.05	39.50
16	43.36	44.95
17	48.46	50.24
18	53.04	55.10
19	56.73	59.20
20	59.56	62.63

*Merchantability is based on solid wood content from a 1-foot stump to a minimum top diameter inside bark of 4 inches for total volume and 6 inches for sawlog volume.

sylvania. For diameters below 10 inches the differences were slight.

In constructing the local volume table for Maryland, a method recently developed by Bickford² was used. One outstanding feature of this new method is that relatively few sample trees are required to develop an accurate volume table. Fundamentally, the tabular data are derived from measurements of four stem sections: (1) bottom half of butt log, (2) top half of butt log, (3) sawlog portion above butt for sawlog-size trees or cordwood portion above butt for

²Bickford, C. A. Unpublished memorandum. Northeast. Forest Expt. Sta.
21 pp. 1951.

poletimber trees, and (4) merchantable volume in tops of sawlog-size trees.

Sample trees used were taken over a range of site and age classes on the Beltsville Experimental Forest. Diameters ranged from 5 to 18 inches at breast height (d.b.h.), but the basic data were extended to include trees up to 20 inches. For all trees sampled, the average form class was 83 and the average butt class was 87. Merchantable lengths, by 1-inch diameter classes, were taken from the following regressions, in which $X = \text{d.b.h.}$ and $Y^1 = \text{merchantable length}$:

(1) Regression for total merchantable length

$$Y^1 = -24.06 + 10.07 X - 0.32 X^2$$

(2) Regression for total sawlog length

$$Y^1 = -45.14 + 12.22 X - 0.39 X^2$$

The merchantable lengths computed from these regressions were applied by Bickford's method to compute volume by stem sections.

The figures given in the local volume table (table 1) represent cubic-foot volumes inside bark from a 1-foot stump to a minimum top diameter inside bark of 6 inches for sawlogs and 4 inches for cordwood. In using these data, please bear in mind that this is a local volume table, prepared primarily for use in the Beltsville Experimental Forest and vicinity.

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Measurements were taken at 1 foot above the ground. (When d.b.h. measurements have usually been taken at stump measurement 1 foot above the ground. But because of the trend toward larger stumps--due partly to increased use of power saws--the additional stump measurement was taken at 6 inches above the ground.)

From these measurements, curves were formulated to express the relationship between stump diameter and diameter at breast height.

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